MEL'NIKOV, A. F.

State of the blood coagulation system in various stages of hypertension. Terap. arkh. 34 no.5:57-59 '62.
(MIRA 15:6)

1. Iz kafedry gospital'noy terapii (zav. - prof. A. I. Germanov) Kuybyshevskogo meditsinskogo instituta.

(HYPERTENSION) (BLOOD--COAGULATION)

MEL'NIKOV, A. D.

"Construction of a New Mast Antenna for Radio Broadcasting Stations"

Vestnik Svyazi, No 4, 1952, pp 17-18

Translation M-1342, 11 Dec 56

BROWMAN, M.Ya.; MEL'NIKOV, A.F.

Device for marking in forge shops. Kuz.-shtam. proizv. 1 no.9:40 S '59. (MIRA 12:12)

(Forge shops--Equipment and supplies)

BROVMAN, M.Ya. (Orsk); MEL'NIKOV, A.F. (Orsk)

Experimental investigation of stresses caused by the pressing-in of a punch into a plastic body. Izv.AN SSSR.Otd.tekh.nauk. Mekh. i mashinostr. no.2:127 Ja-F '59. (MIRA 12:5)

1. Yuzhno-Ural'skiy mashinostroitel'nyy zavod.
(Strains and stresses)

BROVMAN, M.Ya., inzh.; MEL'NIKOV, A.F., inzh.; SURIN, Ye.V., inzh.

New types of metal-cutting tools. Mashinostroitel' no.12: 19-20 D '59. (MIRA 13:3)
(Metal-cutting tools)

BROVMAN, M.Ya.; MIL'NIKOV, A.F.

New design of a friction clutch. Mashinostroitel' no. 4:24-25 F '61. (MIRA 14:3)

(Clutches (Machinery))

BROVMAN, M.Ya.; MEL'NIKOV, A.F.

Determination of force and energy for the marking process. Kuz.-shtam. proizv. 3 no.11:43-44 N '61. (MIRA 14:11)
(Forging machinery--Attachments)

BROVMAN, M.Ya., inzh.; MEL'NIKOV, A.F., inzh.; TSOMIK, I.I., inzh.; MIMUKHIN, B.M., inzh.

Heat treatment of welded structures. Metalloved. i term.obr.met, no.12:28-29 D '61. (MIRA 14:12)

1. Yuzhno-Ural'skiy mashinostroitel'nyy zavod.
(Structural frames--Welding)
(Thermal stresses)

BROVMAN, M.Ya.; GERTSEV, A.I.; ZELICHENOK, B.Yu.; KRIVONOSOV, Yu.I.; RIMEN, V.Kh.; SOKOL, V.N.; MEL'NIKOV, A.F.

Investigating the electric drive parameters of the 2800 mill in the Orsk-Khalilovo Metallurgical Combine. Stal' 22 no.1:45-48 Ja '62. (MIRA 14:12)

1. Yuzhnoural'skiy mashinostroitel'nyy zavod i Orsko-Khalilovskiy metallurgicheskiy kombinat.
(Ural Mountains--Rolling mills--Electric driving)

ZYUZIN, Vladimir Ivanovich; BROVMAN, Mikhail Yakovlevich; MEL'NIKOV, Anatoliy Fedorovich

[Resistance to deformation of steels during hot rolling] Soprotivlenie deformatsii stalei pri goriachei prokatke. Moskva, Metallurgiia, 1964. 269 p. (MIRA 18:1)

L 10432-66 EWT(d)/EWT(m)/EWP(w)/EWA(d)/EWP(v)/EWP(t)/T/EWP(z)/EWP(b)/EWA(c)

ACC NR: AM5011708 EWP(l)/EWP(h) BOOK EXPLOITATION UR

EWP(k) EM/HW/JD

Zyuzin, Vladimir Ivanovich; Brovman, Mikhail Yakovlevich; Mel'nikov, Anatoliy Fedorovich 44.55 44.55 44.55

Deformation resistance of steels during hot rolling (Soprotivleniye deformatsii staley pri goryachey prokatke), Moscow, Izd-vo "Metallurgiya," 1964, 269 p. illus., tables, diagm., biblio., Errata slip inserted. 2,320 copies printed.

TOPIC TAGS: rolling mill, metal deformation resistance, heat resistant steel, alloy steel

PURPOSE AND COVERAGE: This book considers the results of a complex theoretical and experimental investigation of the deformation resistance of steels and alloys as affected by physicochemical factors, thermomechanical parameters, and the nature of the development of deformation with time, as encountered in the actual hot rolling process. On the basis of new methods of investigation, reliable data are obtained on the deformation resistance of steels and alloys which can be used for the power parameter calculation in designing new mills, as well as for the determination of efficient operating conditions for hot rolling mills. The authors acknowledge the contributions by Rokotyan, Ye.S. (Professor, Doctor of Technical Sciences); Yermokhin, F.K. (Engineer, Yuzhuralmash Plant); Markov, V.I. (Engineer, Yuzhuralmash Plant); Volkov, V.N. (Engineer, Yuzhuralmash Plant). This book is designed for scientific workers and engineers interested in the investigation, designing, and exploitation of hot rolling mills. It may also be useful to aspirants and "VUZ" students.

Card 1/5 UDC:621.771.2.001.1

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ACC NR: AM5011708

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TABLE OF CONTENTS:

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ACC NR: AM5011708

SUBMITTED: 10Oct64 SUB CODE: MM, IE NO REF SOV: 123

OTHER: 023

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Card 5/5

L 36135-66 EWT(m)/EWP(v)/T/EWP(t)/ETI/EWP(k) IJP(c) WB/MJW/JD/HM/HW

ACC NR: AT6016761 (A) SOURCE CODE: UR/2776/65/000/042/0055/0058

AUTHOR: Kardonov, B. A.; Mel'nikov, A. F.; Pravdin, A. V.; Tikhonov, A. S.

ORG: none

TITLE: Deformation resistance of EP375 and EP495 alloys

SOURCE: Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii. Sbornik trudov, no. 42, 1965. Proizvodstvo bimetallov (Production of bimetals), 55-58

TOPIC TAGS: nickel base alloy, bimetal, metal cladding, chemical plant equipment, metal deformation / EP375 alloy, EP495 alloy, Kh18N9T alloy, 45 steel

ABSTRACT: The EP375 Ni-Cr-Mo alloy (≤0.05% C, ≤1.0% Si, ≤1.0% Mn, 14.5-16.5% Cr, 14.5-16.5% Mo, 3-4.5% W, ≤2.5% Co, ≤7.0% Fe, 0.01% Ce, with Ni as base) and EP495 Ni-Mo alloy (≤0.03% C, ≤0.25% Si, ≤0.5% Mn, 25.0-29.0% Cr, ≤1.5% Fe, 0.01% Ce, 0.05% Ca, 0.05% Mg, with Ni as base), owing to their high strength and corrosion resistance, are highly promising cladding metals for the production of chemical-industry apparatus, since they lead to savings of scarce metals (Ni, Mo, W, Co) and the bimetal sheets thus produced are lighter than solid metal sheets and their rolling requires less pressure and a lower power consumption. Since these alloys are relatively undeformable, the exact mean unit pressures of metal on the rolls must be known in order

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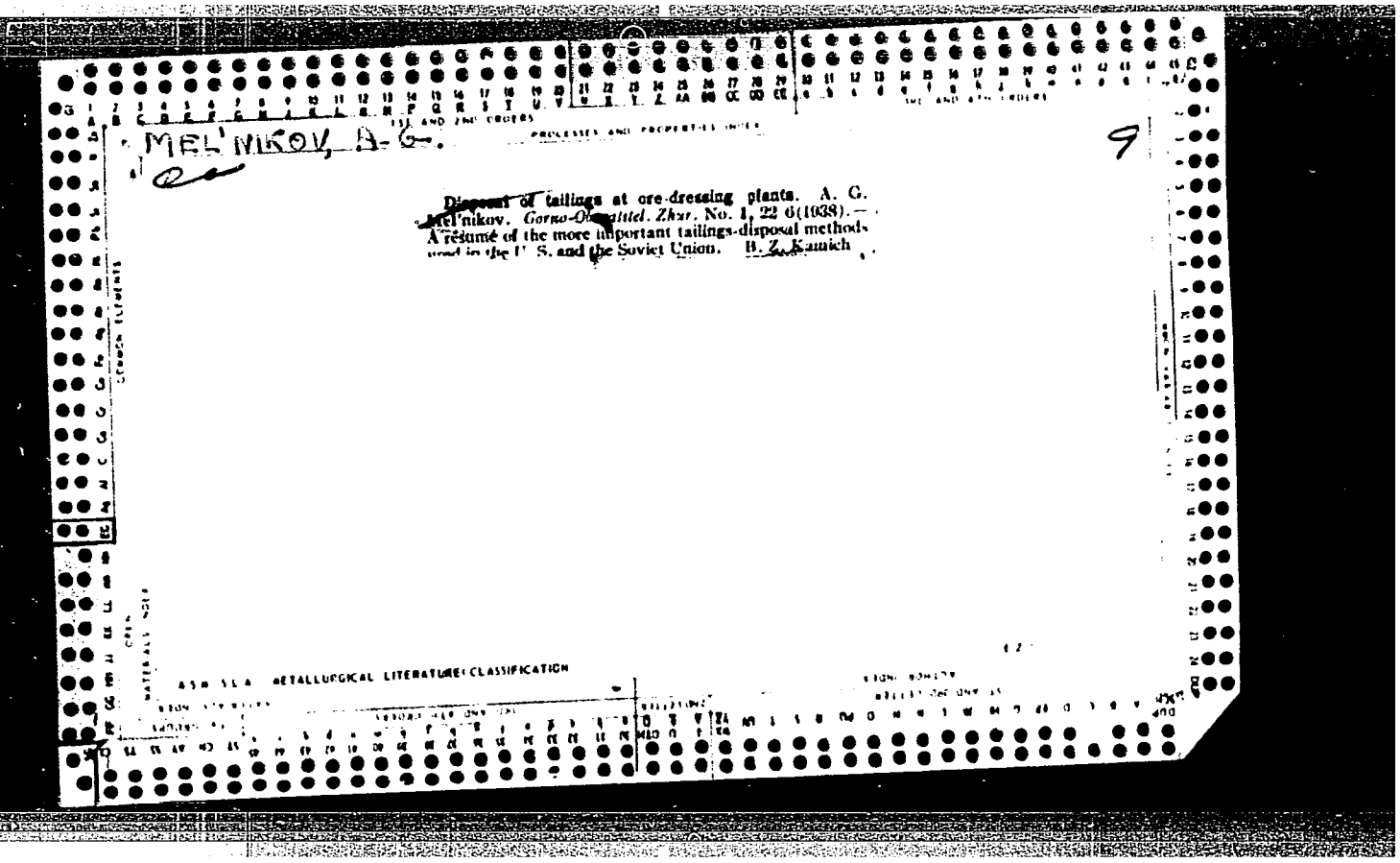
ACC NR: AT6016761

to determine the optimal rolling regimes. Accordingly, the deformation resistance of these alloys was experimentally determined with the aid of a device ("plastometer," constructed at the South Ural Machine Building Plant) for the plastic deformation of metal at temperatures, rates and degrees of deformation corresponding to real rolling conditions, with oscillographic tracing of the deformation stress, absolute deformation of the specimen, and duration of the deformation process. On this basis it was established that EP375 and EP495 alloys display high deformation resistance over the range of the temperatures of hot deformation. Thus, the deformation resistance of EP495 alloy is twice as high as that of Kh18N9T alloy and four times as high as that of 45 steel. The deformation resistance of EP495 alloy is 5-7% higher than that of EP375 alloy. At temperatures below 1000°C the deformation resistance and tensile strength of these alloys markedly increase, which apparently is due to their structural transformations. Therefore, the temperature at the end of rolling should not be lower than 950-1000°C. The increase in deformation rate to 10 from 0.82 sec^{-1} in sheet mills within the 900-1200°C temperature range causes a 25-30% increase in the deformation resistance of these alloys. Orig. art. has: 3 figures, 1 table, 8 formulas.

SUB CODE: 13, 11, 07/ SUBM DATE: none/ ORIG REF: 002/

Joining of Dissimilar Metals

Card 2/2



MEL'NIKOV, A. G.

9

Disposal of tailings at ore-dressing plants. A. G. Mel'nikov. *Gorno-Obogatitel. Zhur.* No. 1, 22-6(1938).—A résumé of the more important tailings-disposal methods used in the U. S. and the Soviet Union. B. Z. Kamich

ASM SLA METALLURGICAL LITERATURE CLASSIFICATION

MEL'NIKOV, A.G.

600

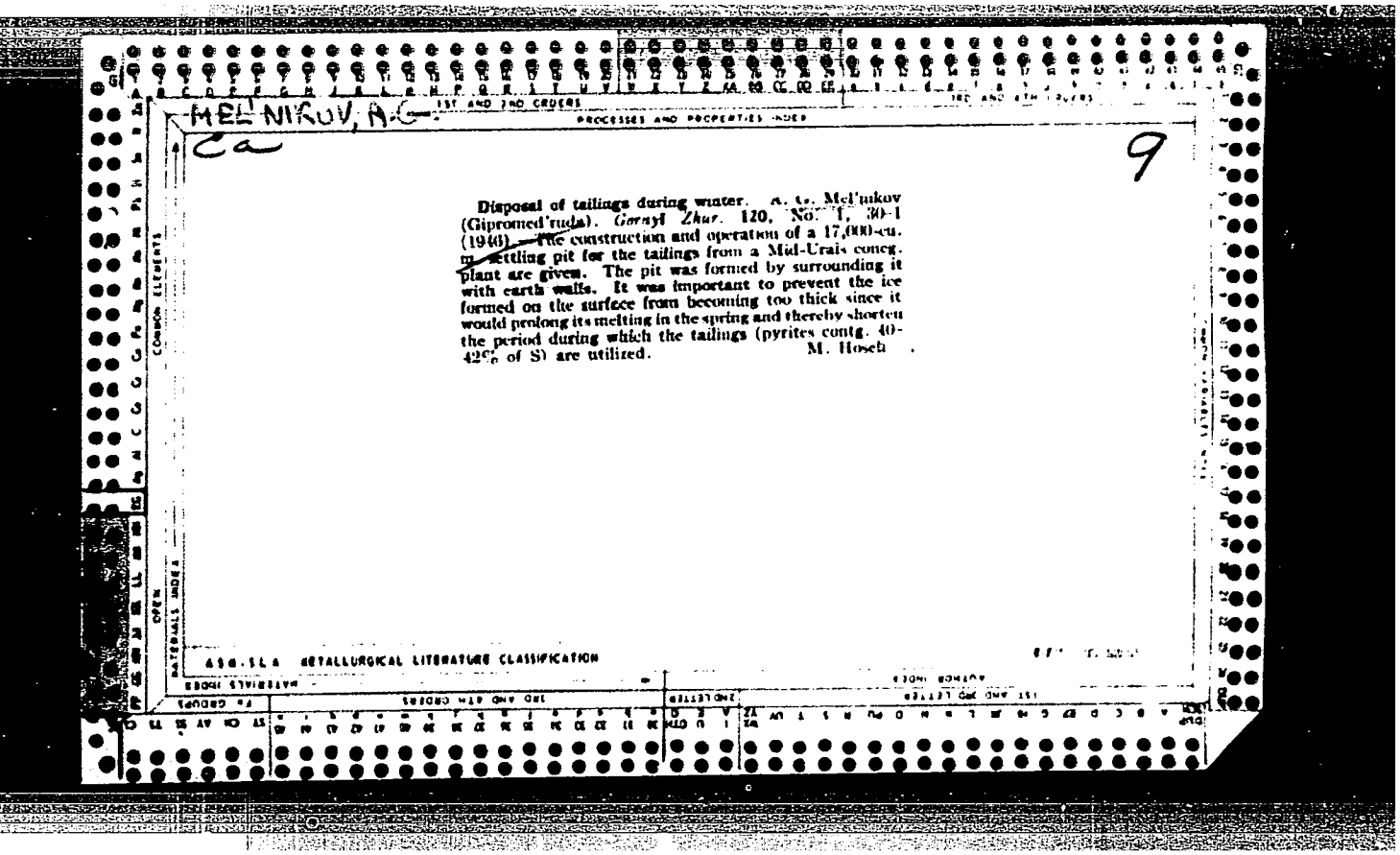
MELNIKOV4A8G8

1. MEL'NIKOV. A.G., SLADKOV, G.I.

2. USSR (600)

Engineer "Sevgiprotsvetmet" (Northern Affiliate of State Institute of Planning Nonferrous Metallurgy Enterprises) "Dumping the Tailings of Concentration Plants", Tsvet. Met. 14, No 3, March 1939.

9. [redacted] Report U-1506, 4 Oct. 1951.



MEL'NIKOV, A.G.

Ca

9

Disposal of tailings during winter. A. G. Mel'nikov (Giprometrudа). *Gornyi Zhur.* 120, No. 1, 30-1 (1940). The construction and operation of a 17,000-cu. m. settling pit for the tailings from a Mid-Urals concg. plant are given. The pit was formed by surrounding it with earth walls. It was important to prevent the ice formed on the surface from becoming too thick since it would prolong its melting in the spring and thereby shorten the period during which the tailings (pyrites contg. 40-42% of S) are utilized. M. Hoseh

A56.5L4 METALLURGICAL LITERATURE CLASSIFICATION

MIRONOV, M.G.; YELISEYEV, I.S.; MEL'NIKOV, A.G.; KRONEBERG, D.A.; SEREDA, B.K.; USTALOV, V.A.

Forty years of the Urals' copper industry. Biul. TSIIN tsvet. met. no.19/20:55-60 '57. (MIRA 11:5)
(Ural Mountain region--Copper mines and mining)

for construction of

AUTHOR: Mel'nikov, A.G. SOV/136-58-10-4/27

TITLE: On the Problem of Determining the Height of the Spillway in the Tailings in a Tailings Reservoir (K voprosu opredeleniya vysoty vodosliva v khvostovom vodoyeme)

PERIODICAL: Tsvetnyye Metally, 1958, nr 10, pp 22 - 23 (USSR)

ABSTRACT: The author considers briefly some of the fundamentals of tailings-reservoir design, with special reference to the height of the spillway. He examines these factors on the basis of data given in "Hydraulics" by I.I.Agroskin, G.T. Dmitriyev and F.I. Pikalov published by Gosenergoizdat, 1950 and shows that if the size grading of the tailing is known, the quantity of solid fraction carried out in the clarified water can be calculated.

ASSOCIATION: Unipromed'

Card 1/1

MEL'NIKOV, A.I.; ARTSIBASHEVA, L.I.

Mechanism of the cleaning of the reinforcement frames. Koks i khim. no.8:30 '62. (MIRA 17:2)

1. Magnitogorskiy metallurgicheskiy kombinat.

MEL'NIKOV, A. G.,Engineer

"Analysis of Technical Control Means for Subway Substations."
Sub 4 Jan 52, Moscow Order of Lenin Power Engineering Inst imeni V. M. Molotov

Dissertations presented for science and engineering degrees in Moscow during 1951.

SO: Sum. No. 480, 9 May 55

S/187/59/000/012/005/005
D053/D113

9.2150

AUTHOR: Mel'nikov, A.G.

TITLE: Electronic ripple filter

PERIODICAL: Tekhnika kino i televideniya, no. 12, 1959, 82, abstract. Izvestiya vysshikh uchebnykh zavedeniy MVO - SSSR - Radiotekhnika, no. 3, 1959, 366

TEXT: The use of capacitances is undesirable or inefficient in circuits working at an elevated temperature and in circuits with a high filtering factor. The described electronic filter permits the smoothing of the rectified voltage ripples without the use of smoothing capacitances. An electron tube in the filter circuit serves as the filter capacitance. The possibility of designing analogous transistor circuits is pointed out. [Abstracter's note: The above text is a full translation of the original Soviet abstract].

Card 1/1

05206
SOV/142-2-3-14/27

9(2,3)
AUTHOR: Mel'nikov, A.G.

TITLE: An Electronic Pulsation Filter

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiotekhnika, 1959, Vol 2, Nr 3, p 366 (USSR)

ABSTRACT: Usually, for suppressing rectified voltage pulsation, RC and LC filters are used. However, in a number of cases, for example in circuits, working under the condition of increased temperatures, or in circuits with high filtration factors, the application of capacitances is undesirable or ineffective. Therefore, the author presents an electronic filter suppressing rectified voltage pulsations without applying suppressing capacitances. Two examples for such circuits are shown in figs.1 and 2. Analogous filter circuits equivalent to capacitances were suggested in the paper by S.I. Tetel'baum, IEST, 1939, Nr 1, 31. The publication of this article was recommended by the Kafedra elektricheskikh izmereniy i avtomaticheskikh ustroystv Azerbaydzhanskogo industrial'nogo instituta imeni Azizbekova (Chair of Electrical Measurement and

Card 1/2

05206
SOV/142-2-3-14/27

An Electronic Pulsation Filter

Automatic Devices of the Azerbaydzhan Institute imeni Azizbekov.
There are 2 circuit diagrams, and 1 Soviet reference.

SUBMITTED: October 29, 1958

Card 2/2

MEL'NIKOV, A.G.

Laterolog equipment having a three-strand cable with a three-electrode system. Izv.vys.ucheb.zav.; neft' i gaz 3 no.2: 107-111 '60. (MIRA 13:6)

1. Azerbaydzhanskiy institut nefti i khimii im. M. Azizbekova.
(Oil well logging, Electric--Equipment and supplies)

SHAKHNAZAROV, A.M.; ALIZADE, G.A.; MEL'NIKOV, A.G.; ALIYEV, T.M.

BK-7-AzINEFTEKHIM laterlogging a seven-electrode device on a single-core cable. Izv. vys. ucheb. zav.; neft' i gaz 3 no.5:121-126 '60. (MIRA 15:6)

1. Azerbaydzhanskiy institut nefti i khimii imeni Azizbekova.
(Oil well logging, Electric—Equipment and supplies)

MELIK-SHAKHNAZAROV, A.M.; MEL'NIKOV, A.G.

Using the intensity method for designing remote measurement systems of geophysical electric logging apparatus. Izv.vys. ucheb.zav.; neft' i gaz 3 no.6:129-134 '60.
(MIRA 13:7)

1. Azerbaydzhanskiy institut nefti i khimii im. M.Azizbekova.
(Oil well logging, Electric--Equipment and supplies)

MIRSALIMOV, R.M.; MEL'NIKOV, A.G.

Effect of electrode capacitance on the performance of geophysical apparatus. Izv. vys. ucheb. zav.; neft' i gaz 3 no.8:117-121 '60. (MIRA 14:4)

1. Azerbaydzhanskiy institut nefti i khimii imeni M.Azizbekova.
(Oil well logging, Electric—Equipment and supplies)

MEL'NIKOV, A.G.

Development of a Laterlogging device with a three-electode probe on a single core cable. Izv. vys. ucheb. zav.; neft' i gaz 3 no.12:95-98 '60. (MIRA 14:10)

1. Azerbaydzhanskiy institut nefti i khimii imeni M. Azizbekova.
(Oil well logging, Electric--Equipment and supplies)

MEL'NIKOV, A. G.

Cand Tech Sci - (diss) "Automatic measuring machines for determining specific rock resistances in wells (on the basis of the electric lateral logging method)." Kuybyshev, 1961. 18 pp with diagrams; (Ministry of Higher and Secondary Specialist Education USSR, Kuybyshev Industrial Inst imeni V. V. Kuybyshev); 250 copies; free; (KL, 5-61 sup, 191)

MEL'NIKOV, A.G.; ORLOV, G.L.

Linear converter for telemetering systems with amplitude modulation. Izv.vys.ucheb.zav.; prib. 6 no.6:50-55 '63. (MIRA 17:3)

1. Azerbaydzhanskiy institut nefti i khimii imeni Azizbekova. Rekomendovana kafedroy elektricheskikh izmereniy i vychislitel'noy tekhniki.

MELIK-SHAKHNAZAROV, A.M.; MEL'NIKOV, A.G.; ORLOV, G.L.; SARKISOV, K.A.

Multichannel remote-control measuring device with double amplitude modulation for geophysical investigations of wells on a single cable. Izv. vys. ucheb. zav.; neft' i gaz 6 no.10:87-91 '63. (MIRA 17:3)

1. Azerbaydzhanskiy institut nefti i khimii im. M.Azizbekova.

MEL'NIKOV, A.G.; SHAKHMARDANOV, Sh.M.; CHUKIN, V.T.

Investigating a laterologging apparatus with a seven-electrode sonde. Izv.vys.ucheb.zav.; neft' i gaz 7 no.4:89-93 '64. (MIRA 17:5)

1. Azerbaydzhanskiy institut nefti i khimii imeni M.Azizbekova, i Vsesoyuznyy nauchno-issledovatel'skiy institut geofizicheskikh metodov razvedki.

18.7100, 18.2000

75973
SOV/133-59-10-34/39

AUTHORS: Koroleva, V. A., Mel'nikov, A. I., Bateneva, M. K., Serebrenikov, A. V., Konovalova, T. S.

TITLE: Effect of the Initial Structure of Transformer Steel on Its Magnetic Properties

PERIODICAL: Stal', 1959, Nr 10, pp 947-948 (USSR)

ABSTRACT: The authors attempted to determine (1) the influence of the initial structure of transformer steel on its electric and magnetic properties, and (2) optimal annealing temperatures in tunnel-type furnaces for steel with different initial structure. The authors found that the finishing temperature (850 C instead of 650 C by reducing the number of passes to 2 instead of 5) for 0.4 mm thick sheets decisively influences the initial and the final structure and, consequently, magnetic properties. The fuller the recrystallization and the larger the grain size before annealing, the larger it is after low-temperature annealing and, consequently, the lesser the specific loss. Optimal annealing temperatures were determined for steels produced

Card 1/3

in both, open-hearth and electric furnaces. Optimal annealing temperatures: 880 C for electric steel (metal temperature 860 to 870 C), 920 C for open-hearth steel. Table 1 shows annealing temperature rates tested and the resulting magnetic properties of steel served to select optimal annealing temperatures:

TABLE 1

	Rates			
	I	II	III	IV
Temperatures in furnace zones, °C				
first	940	960	970	980
second	980	970	980	990
third	930	920	930	940
Mean specific loss P_{10}, w/kg				
electric steel	1.35	1.37	-	-
open-hearth steel	1.51	1.49	1.45	1.44

Effect of the Initial Structure of Transformer Steel on Its Magnetic Properties

75973
SOV/133-59-[illegible]-3/39

Elevated annealing temperatures for electric steel (II) increased specific losses while the same conditions (II, III, IV) for open-hearth steel decreased them. Rate III is preferable for open-hearth steel since at higher temperatures (IV) embrittlement was observed. As a result of the above tests, the plant introduced separate annealing for open-hearth and for electric steel reducing spoilage.

ASSOCIATION: Upper Iset' Metallurgical Plant (Verkh-Isetskiy metallurgicheskiy zavod)

Card 3/3

KOROLEVA, V.A., MEL'NIKOV, A.I., TOROPOV, A.G., SAFRONOVA, R.Ya.

Avoiding waviness of hot-rolled electrical steel sheets. Metallurg 5 no.7:28- 9 Jl '60. (MIRA 13:7)

1. Verkh-Isetskiy metallurgicheskiy zavod.
(Sheet steel) (Annealing of metals)

MEL'NIKOV, A.I.

Mechanism for cleaning coke ovendoors. Koks i khim. no.9:35-37 '61. (MIRA 15:1)

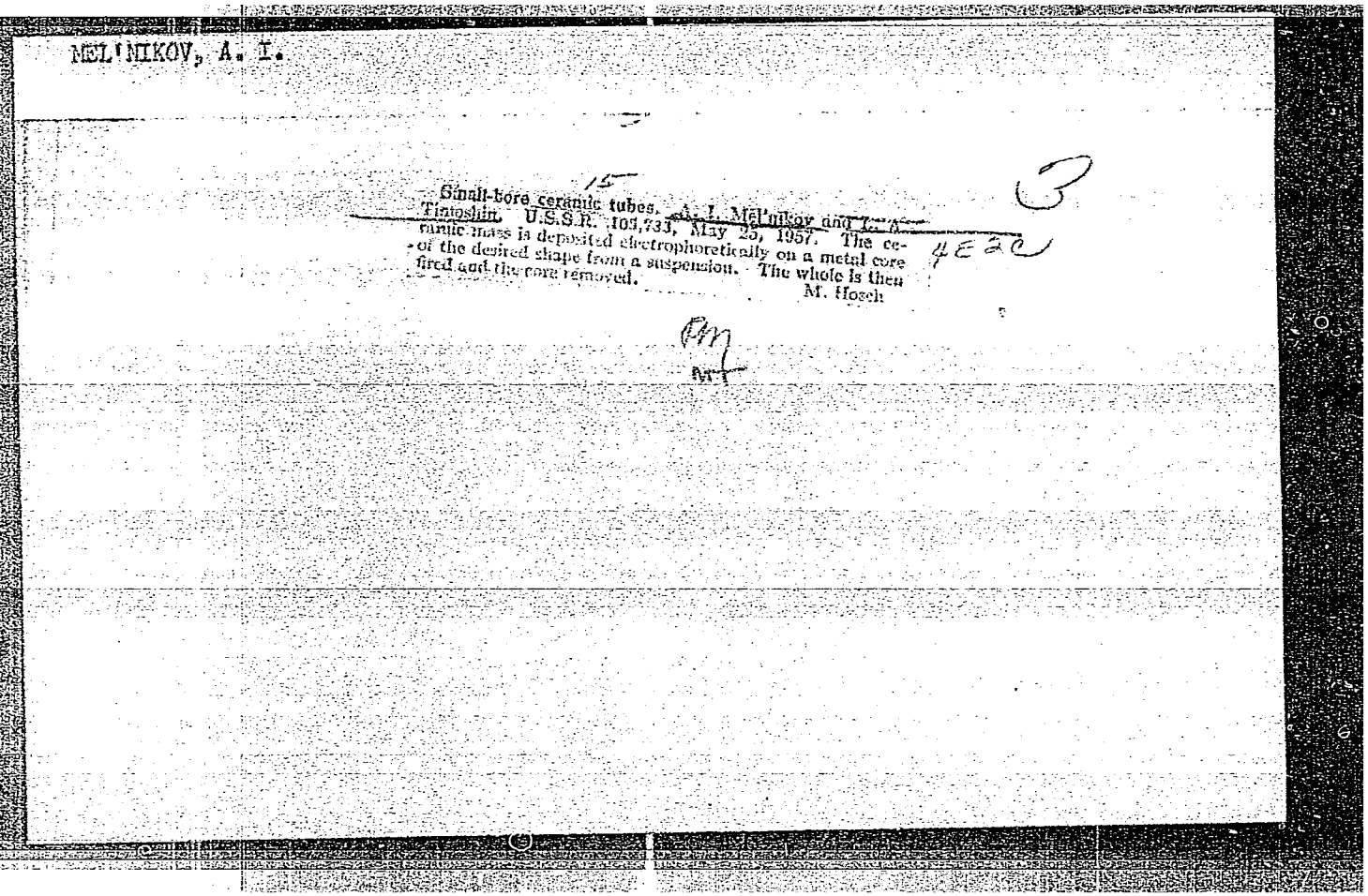
1. Magnitogorskiy metallurgicheskiy kombinat.
(Coke ovens)

MEL'NIKOV, A.I.; TROFIMOV, F.T., mekhanik tkatskoy fabriki; MILOSERDOV, I.V. master po remontu oborudovaniya.

Useful brochure about bearing alloys "Zinc base bearing alloys and their use in light industry" By A.V. Mastriukov, V.P. Gusev. Reviewed by A.I. Mel'nikov, F.T.Trofimov, I.V. Miloserdov). Tekst.prom.16 no.10:69-70 O '56. (MLRA 10:1)

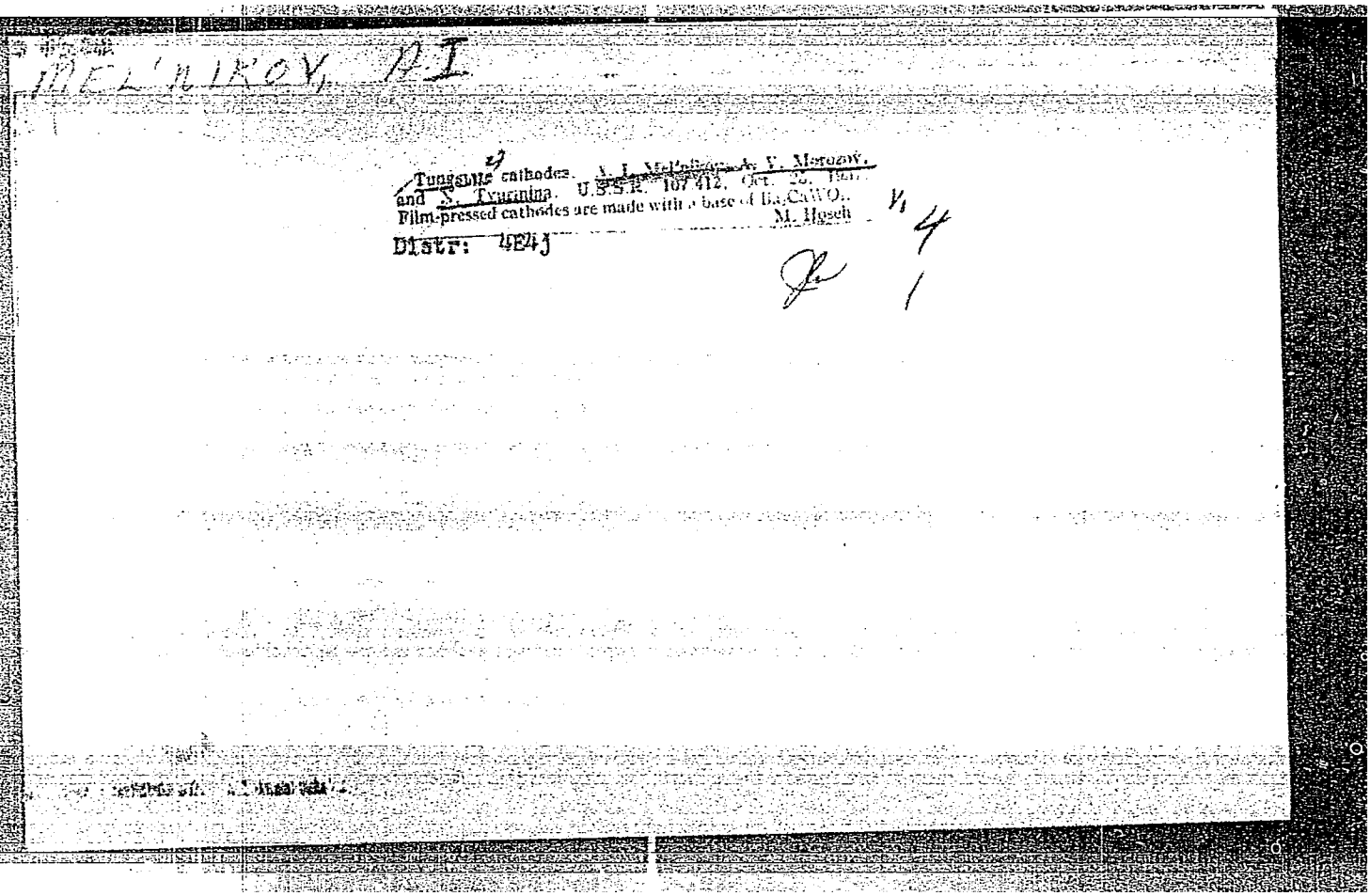
1. Nachal'nik remontno-montazhnogo otdela Moninskogo kombinata (for Mel'nikov).

(Bearings) (Mastriukov, A.V.)
(Gusev, V.P.)



MEL'NIKOV, A. I.

Small-bore ceramic tubes. A. I. Mel'nikov and T. A. Tiatoshin. U.S.S.R. 103,733, May 25, 1957. The ceramic mass is deposited electrophoretically on a metal core of the desired shape from a suspension. The whole is then fired and the core removed.
M. Hoseh



Tungsten cathodes. A. I. Mel'nikov, A. V. Morozov, and S. Tyurnina. U.S.S.R. 107,412, Oct. 25, 1957. Film-pressed cathodes are made with a base of Ba,CaWO4. M. Hoseh

Distr: 4E4j

MEL'NIKOV, A.I.

USSR/Physical Chemistry - Kinetics, Combustion, Explosions, Topochemistry, Catalysis. B-9

Abs Jour : Referat Zhur - Khimiya, No 1, 1958, 484

Author : A.I. Mel'nikov.
Inst :
Title : Reduction of Silicium and Germanium Chlorides and Preparation of Crystalline Films.

Orig Pub : Zh. neorgan. khimii, 1957, 2, No 2, 233-237

Abstract : The optimum conditions of preparation of pure crystalline fulms of Si and Ge by reduction of $SiCl_4$ and $GeCl_4$ with hydrogen were studied. The experimental data and the computed values of the equilibrium constant of the reduction reaction of $SiCl_4$ indicate a considerable shift of the equilibrium towards the side of an increased yield of Si at a temperature rise (up to 1200°). The yield of Ge also increases with the temperature. When the concentration of H_2 was increased 90 to 100 times as compared with the

Card 1/2

USSR/Physical Chemistry - Kinetics, Combustion, Explosions, Topochemistry, Catalysis. B-9

Abs Jour : Ref Zhur - Khimiya, No 1, 1958, 484

stoichiometric one, dense films of Si and Ge 60 to 80 μ thick were obtained. It is shown that the thickness of the Si and Ge films and their structure depend on the duration of the crystallization process, on the concentration of Si or Ge vapors and on the temperature. The structure of the obtained films is polycrystalline, and the mean crystal dimensions vary from 0.1 to 30 μ depending on the experiment conditions. Little admixtures of O_2 and H_2O in hydrogen sharply deteriotate the film quality.

Card 2/2

SOV/137-59-4-7945

Translation from: Referativnyy zhurnal, Metallurgiya, 1959, Nr 4, p 84 (USSR)

AUTHORS: Maklakov, A.A., Mel'nikov, A.I., Morozov, A.V., Ostapchenko, Ye.P.

TITLE: A Method of Obtaining Tri-Barium Tungstate

PERIODICAL: Avt. sv. USSR 113045, 15.08.58

ABSTRACT: The described method of obtaining Ba_2WO_6 yields products of greater homogeneity and higher purity than previously known methods. In consists in the joint precipitation of Ba tungstenate and Ba carbonate from an aqueous solution of $(NH_4)_2WO_4$, $(NH_4)_2CO_3$ and $Ba(NO_3)_2$. Three weight portions of $(NH_4)_2WO_4$ and $(NH_4)_2CO_3$ are dissolved in 10 weight portions of water, the solutions are mixed, heated up to 60°C and a solution of 1 weight portion $Ba(NO_3)_2$ and 7 weight portions of water, heated up to 60°C, is added. The precipitate is filtrated, dried for 1 hour at ~100°C and roasted at ~1,400°C. Hereby a $BaWO_4 + 2BaCO_3 = Ba_3.WO_6 + 2CO_2$ reaction takes place. The yield of the finished product is 96 - 98% of the theoretical amount.

Ye.Z.

Card 1/1

MEL'NIKOV, A.I.

109-3-3/23

AUTHORS: Mel'nikov, A.I., Morozov, A.V., Popov, B.N. and Maklakov, A.A.

TITLE: Pressed Cathode Based on Barium-calcium Tungstate (Pressovannyy katod na osnove bariy-kal'tsiyevogo vol'framata)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol.III, No.3, pp. 322 - 328 (USSR)

ABSTRACT: The active material which is employed in the preparation of pressed film-type cathode should have the following characteristics: capacity to produce the necessary quantity of the activator during its interaction with the reducing agent; good stability under normal atmospheric conditions; a low gas-absorption capacity and a low evaporation rate. The above requirements are, to a large extent, fulfilled by barium tungstate, Ba_3WO_6. This substance can be prepared from pure barium carbonate and tungsten oxide, the chemical reaction being in the form:

$$3BaCO_3 + WO_3 = Ba_3WO_6 + 3CO_2 \quad (1).$$

Properties of the cathode can be further improved by using

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Pressed Cathode Based on Barium-calcium Tungstate

barium-calcium tungstate instead of Ba_3WO_6. This can be obtained by adding into the mixture of barium carbonate and tungsten oxide an appropriate quantity of calcium carbonate. The reactions are then in the form represented by Eqs. (2), (3) and (4). The resulting material was used in two types of pressed, experimental cathodes (see Figs. 2a and 6). The cathodes were in the form of molybdenum cylinders; the active mixture consisted of 90% tungsten, 9.5% tungstate and 0.5% aluminium (by weight). The cathodes were mounted in special diodes (see Fig.3) which were fitted with special cooling copper anodes. The distance between the cathodes and the anodes was 0.4 to 0.6 mm. The experimental results are shown in Figs. 4, 5, 6 and 7. Fig. 4 shows voltage current characteristics of the diodes taken at various cathode temperatures; the two curves of Fig. 4a were taken under pulse conditions, while the curves of Fig. 46 were measured under static conditions. Fig. 5 shows the static emission current of a tube as a function of time; Curve 1 refers to the cathode made of barium tungstate, while Curve 2 illustrates the emission of a barium-calcium tungstate cathode. Fig. 6 illustrates the influence of hydrogen-poisoning on barium-calcium tungstate cathodes (full

Pressed Cathode Based on Barium-calcium Tungstate

curves illustrate the poisoning effect, while 'dotted' curves illustrate the process of the reactivation of the cathode). Secondary electron emission of the cathodes was also investigated at temperatures of 800, 900, 1 000, 1 100 and 1 200 °C and the resulting curves are shown in Fig.7. From the data obtained, it is concluded that the barium-calcium tungstate cathodes can produce stable emission densities of 6 to 7 A/cm^2 at operating temperatures of 1 130 to 1 150 °C; the cathodes have a life of about 1 000 hours, provided the anodes of the tubes are properly cooled.
There are 7 figures, and 7 references, 5 of which are English, 1 French and 1 Russian.

SUBMITTED: April 10, 1957

AVAILABLE: Library of Congress

Card 3/3

SOV/109-3-8-5/18

AUTHORS: Kapitsa, P.L., ~~Mel'nikov, A.I.~~, Morozov, A.V., Popov, B.., Sobolevskaya, R.B., Tsarev, B.M. and Shul'man, A.R.

TITLE: Thermionic Properties of Barium Tungstate (Termoelektronnyye svoystva vol'framata bariya)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol 3, Nr 8, pp 1010 - 1016 (USSR)

ABSTRACT: The work described was concerned with the investigation of the thermionic emission of barium tungstate and Ba_2CaWO_6. The investigation was undertaken since it was thought that the resulting data might be useful in explaining the operation of the pressed cathodes and other cathodes which contain barium tungstate. The investigations were carried out on directly heated cathodes which were based on tungsten and molybdenum cores. The measurements were made on special experimental diodes, fitted with protective anodes. The cathode temperature was determined by measuring the change in the resistance of the core. All the measurements were done under static conditions. The coating of Ba_3WO_6 and Ba_2CaWO_6 were effected by two methods:. a) a filament of the

Card1/4

core metal was passed through a drop of the coating substance mixed with a binder; b) cataphoretic coating was used. In the first case, coarse-grain coatings were obtained, while the second method permitted obtaining the particles having a diameter of about 1 - 5 μ. The cathodes were de-gassed by heating up to 1 250 °K for the duration of 1 - 2 hours without taking any current.

This processing resulted also in a partial activation of the cathodes. Further activation of the cathodes (by heating and taking the current) was then carried out. During the preliminary activation, it was found that the work function (as measured from the Richardson curves) was of the order of 2.2 eV, while after the final activation, the work function dropped to 1.2 - 0.5 eV. The characteristics of a barium-tungstate cathode after final activation are shown in Figure 2. The emission current and the work function of the same cathode for various activating temperatures are given in Table 1. On the other hand, it was found that the cathodes of Ba_2CaWO_6 had very low emission densities. These were of the order

$\mu A/cm^2$, as can be seen from Table 2. By comparing the results of Table 2 with those for Ba_3WO_6 (given in Table 3), it is seen that the emission of the latter is about 100 times higher than that of the former. It was found that the curve:

$$\lg \frac{I}{T^2} = f\left(\frac{1}{T}\right)$$

for the cathode of barium tungstate consists of three regions (Figure 4). At low temperatures (below 900 °K), the curve has the highest slope; the work function in this region is equal to 1.3 eV. In the regions of temperatures from 900 - 1 250 °K, the work function has a value of about 0.6 - 0.7 eV. Finally, at temperatures above 1 250 °K, the current decreases as a function of temperature and the slope of the curve cannot be regarded as representing the work function.

Thermionic Properties of Barium Tungstate SOV/109-3-8-5/18

There are 5 figures, 5 tables and 4 references, 3 of which are Soviet and 1 English.

SUBMITTED: January 29, 1958

Card 4/4 1. Barium tungstates--Properties 2. Thermionic emission--Analysis
3. Cathodes--Performance

48-22-5-18/22

AUTHORS: Mel'nikov, A. I., Morozov, A. V., Popov, B. N., Maklakov, A. A.

TITLE: Pressed Cathodes of Aluminates and Tungstates of Barium and Calcium (Pressovannyye katody na osnove alyuminatov i vol'framatov bariya-kal'tsiya)(Data From VIII. All Union Conference on Cathode Electronics, Leningrad, October 17-24, 1957)(Materialy VIII Vsesoyuznogo soveshchaniya po katodnoy elektronike, Leningrad, 17-24 oktyabrya 1957 g.)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 1958 Vol. 22, Nr 5, pp. 613-621 (USSR)

ABSTRACT: Recently the demand for new types of cathodes has risen, as the oxide cathodes fail in the acception of emission currents of high density (mostly in high-frequency apparatuses). Therefore the idea of uniting the cathode space, where the active substance is formed, with the sponge by means of a direct introduction of barium combinations into the pores of the latter, has been put forward. There are a) impregnated (Ref 1) and b) pressed catholes (Ref 2). Figure 1 demonstrates the construction of a pressed cathode. It is a molybdenum cylinder, into to which a mixture of the active substance, tungsten powder and the reducing substances has been pressed. At the working

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temperature of the cathode, the interaction of the components of this mixture leads to the formation of free barium and to the activation of the cathode. As the barium compounds tested so far had proved unsatisfactory (reference 3,4), the authors set themselves the task of testing the compounds resulting from the interaction of alkaline earth metal oxides of barium and calcium with acidity- -and amphoteric oxides. The investigations yielded the following conclusions: 1. The pressed cathodes mentioned in the title permit an uninterrupted emission up to a current density of 8 A cm^{-2} if the time of operation exceeds 1000 hours. 2. The mechanical and electrical stability of the cathodes is satisfactory, they are easily enough reactivated after the poisoning. 3. Their production is simpler than that of the L-cathodes. 4. The emission properties and the life of the cathodes depends on the properties of the active substance. Here Barium-calcium tungstate is superior to aluminates because

Pressed Cathodes of Aluminates and Tungstates of Barium and Calcium 48-22-5-18/22

of its stability in air. 5. The tungstate mentioned last makes possible a longer time of operation than the barium tungstate. 6. Preliminary tests have shown that the influence of considerable changes in the concentration of tungstate in the emitter on the emission currents of the cathodes is insignificant. A final interpretation of this phenomenon has not been given yet. S. D. Uman, Z. V. Kukushkina, L. G. Sherstnev, Ye. P. Ostapchenko, A. A. Gugnin, A. I. Figner and the first two authors joined in the discussion. There are 9 figures and 9 references, 2 of which are Soviet.

1. Cathodes (Electron tube)--Design 2. Cathodes (Electron tube) --Materials 3. Cathodes (Electron tube)--Effectiveness 4. Barium aluminates--Applications 5 Calcium aluminates--Applications 6. Barium tungstates--Applications 7 Calcium tungstates--Applications

Card 3/3

MEL'NIKOV, A.I.; MOROZOV, A.V.; SOBOLEVSKAYA, R.B.; SHUL'MAN, A.R.

Thermionic emission from barium tungstate. Fiz. tver. tela 2 no.4: 704-708 Ap '60. (MIRA 13:10)
(Barium tungstate) (Thermionic emission)

25975
S/539/60/000/031/008/014
E021/E406

9,3120
5.2200

AUTHORS: Kovtunenko, P.V., Kondakov, B.V., Morozov, A.V. and Mel'nikov, A.I.

TITLE: Evaporation of alkaline earth metals from cathodes prepared on a barium-calcium tungstate base

PERIODICAL: Moscow. Khimiko-tekhnologicheskiy institut. Trudy, No.31, 1960. Issledovaniye v oblasti khimii i tekhnologii elektrovakuumnykh materialov, pp.55-59

TEXT: The rate of evaporation of alkaline earth metal from pressed cathodes prepared from refractory salts of these metals is important. The cathodes used in the present investigation were prepared by pressing a mixture of tungsten, aluminium and barium-calcium tungstate into a molybdenum cylinder at a pressure of 20 tons/cm^2 and sintering at 1950°C. As the cathode is used at 1100 to 1200°C free alkaline earth metal is formed as follows:

$$2Ba_3WO_6 + 6Al = 3Ba + 2W + 3BaAl_2O_4$$

Some of the free barium formed immediately evaporates and the rest migrates along the emitter and evaporates gradually. The

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Evaporation of alkaline earth ...

apparatus used to determine the rate of evaporation was a high-vacuum system and the minimum quantity of barium which could be detected was 5×10^{-9} g. After evacuating the apparatus, the cathode was activated for 30 minutes at 1150 to 1200°C and then the rate of evaporation of barium was determined. Fig.4 shows typical curves of the rate of evaporation of Ba (in g/hr) against time of working of the cathode (hours). The rate of evaporation is highest in the first few hours. With increased time, the rate decreases and tends to a constant value. There are 4 figures, 2 tables and 4 references: 3 Soviet and 1 non-Soviet. The reference to an English language publication reads as follows: E.S.Rittner, W.C.Rutledge, R.H.Ahlert, J.Appl.Phys., 28, No.12, 1468 (1957).

9.3120
26.2521

S/109/62/007/009/012/018
D409/D301

AUTHORS: Kovtunenko, P.V., Morozov, A.V., Mel'nikov, A.I., and Gusakov, V.V.

TITLE: Evaporation of alkaline-earth metals from rhenium-barium cathodes

PERIODICAL: Radiotekhnika i elektronika, v. 7, no. 9, 1962, 1593 - 1597

TEXT: The authors studied the rate of evaporation of barium and of barium oxide from rhenium-barium cathodes, as a function of the period of operation of the cathode; the change in the emission properties of the cathode was also studied. The present investigation was prompted by the satisfactory results, obtained in replacing tungsten by rhenium as a cathode material. It was found that the new (rhenium-barium) cathode gives the same emission-current density (5-6 A/cm^2) as the tungsten-barium cathode, while operating at lower temperatures; the total rate of evaporation of barium (or of calcium from its base) and of its compounds, is of the same order of magnitude as that from tungsten-barium cathodes. The rate of

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evaporation of the free barium (calcium), was determined by a chemical method, described by the authors in an earlier work. The total amount of free barium and of its oxides was determined by a spectral method, developed by S.A. Savostin. The experiments were conducted by means of an experimental diode with a watercooled copper-anode. It was found that the rate of evaporation of alkaline-earth metals from cathodes which belong to different lots, may differ greatly from lot to lot; this is apparently due to the previous history of the specimens. The dependence of the rate of evaporation on the period of operation, is the same for rhenium-barium cathodes as for tungsten-barium cathodes. It was found that in many cases, but not always, a drop in the rate of evaporation is accompanied by a drop in emission; this indicates the need for further experimental evidence. The fraction of free barium, evaporated from the cathode, did not exceed 10 % of the total amount of evaporated barium; but the amount of barium which is oxidized during the process, was not determined in the experiments. There are 4 figures and 1 table.

SUBMITTED: March 19, 1962

Card 2/2

L 06226-67 EWT(m)/EWP(t)/ETI IJP(c) JD/JG

ACC NR: AP6029823 SOURCE CODE: UR/0363/66/002/008/1467/1476

AUTHOR: Kislyakov, I. P.; Mel'nikov, A. I.; Sokolovskaya, R. V.; Tokunov, O. I.

ORG: Moscow Institute of Fine Chemical Technology im. M. V. Lomonosov (Moskovskiy institut tonkoy khimicheskoy tekhnologii)

TITLE: Reactions of formation of barium tungstates in solid phases

SOURCE: AN SSSR, Izvestiya. Neorganicheskiye materialy, v. 2, no. 8, 1966, 1467-1476

TOPIC TAGS: tungstate, barium compound, barium oxide, carbonate, CHEMICAL REACTION

ABSTRACT: Thermal, x-ray phase and chemical analyses were used to study the solid-phase reactions of $BaCO_3$ with WO_3, $BaCO_3$ with $BaWO_4$, $BaCO_3$ with $2BaO \cdot WO_3$, and $BaWO_4$ with $3BaO \cdot WO_3$. The formation of $BaWO_4$ begins at 300°C; a catalytic participation of $H_2O_{(g)}$ in the formation of $BaWO_4$ is postulated. The reaction of α-$BaCO_3$ with WO_3 increases markedly at 515-575°C and in an abrupt manner at 950°C as a result of the formation of a liquid eutectic phase composed of 50 mole % $BaWO_4$ and 50 mole % WO_3. The reaction of formation of $BaWO_4$ does not reach completion in stoichiometric compositions (at a heating rate of 400 deg/hr) up to 1280°C. An increase in excess $BaCO_3$ above the stoichiometry causes a virtually complete formation of $BaWO_4$ at 950°C. It is shown that when the mixtures $BaCO_3/WO_3 > 1$ and $BaCO_3/BaWO_4 = 1$ are heated, the reactions of formation of $2BaO \cdot WO_3$ and $3BaO \cdot WO_3$ occur irrespective of the relative amount

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UDC: 546.431'786

L 06226-67

ACC NR: AP6029323

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of $BaCO_3$ present in the mixture. $2BaO \cdot WO_3$ is formed by the reaction of $BaCO_3$ with $BaWO_4$ at 810°C. The rate of its formation increases markedly above 950-990°C. The effect of formation of $2BaO \cdot WO_3$ is displayed at 1130-1160°C depending upon the initial composition. In addition to $2BaO \cdot WO_3$, $3BaO \cdot WO_3$ begins to form at about 1000°C, and the rate of its formation increases substantially above 1090°C. The effect of formation shows up at 1210-1280°C depending upon the initial composition. Authors thank G. A. Vydrik for performing test recordings of the composite thermograms and S. I. Kopeykin and I. V. Kovaleva for their participation in the work. Orig. art. has: 5 figures, 1 table and 11 formulas.

SUB CODE: 07/ SUBM DATE: 27Jun65/ ORIG REF: 008/ OTH REF: 009

Card 2/2 HB

ACC NR: AP6033468 SOURCE CODE: UR/0413/66/000/018/0054/0054

INVENTOR: Tager, A. S.; Mel'nikov, A. I.; Kobel'kov, G. P.; Tsebiyev, A. M.

ORG: None

TITLE: A method for generating and amplifying SHF oscillations using semiconductor diodes. Class 21, No. 185965

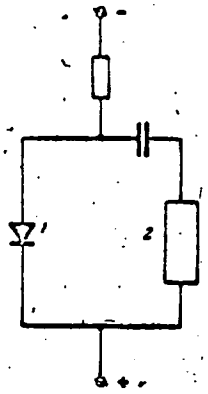
SOURCE: Izobret prom obraz tov zn, no. 18, 1966, 54

TOPIC TAGS: SHF oscillator, SHF amplifier, semiconductor diode, waveguide, resonator

ABSTRACT: This Author's Certificate introduces a method for generating and amplifying SHF oscillations using semiconductor diodes. Stable generation or amplification of oscillations in the centimeter and millimeter wavelength ranges is produced by placing the semiconductor diodes in a resonance or waveguide system, connecting them in a DC circuit and selecting their parameters and working points on the voltage-current curve in such a way that the resistance of the diodes on direct current and on frequencies below the working frequencies is positive while the resistance in the working frequency range is negative and greater than the resistance of losses in the diodes and in the high-frequency circuit.

Card 1/2 UDC: 621.373.422

ACC NR: AP6033468



1—diodes; 2—high-frequency circuit

SUB CODE: 09/ SUBM DATE: 27Oct59

Card 2/2

ACC NR: AM6029193 Monograph UR/

Kudintseva, Galina Alekseyevna; Mel'nikov, Aleksandr Ivanovich; Morozov, Aleksandr Vasil'yevich; Nikonov, Boris Pavlovich

Thermionic cathodes (Termoelektronnyye katody) Moscow, Izd-vo "Energiya," 1966. 367 p. illus., biblio. 7500 copies printed.

TOPIC TAGS: electron tube cathode, thermionic emission, electron emission, emissivity

PURPOSE AND COVERAGE: This book may be used by students studying electronics and also by engineers and technicians concerning with the design of electrovacuum devices and cathode production technology. The book describes the technology of production and basic physical, technological and operational characteristics of various types of thermo-ionic cathodes for vacuum devices such as oxide cathodes, high-temperature cathodes based on the rare earth oxides and thorium oxide, various forms of pressed, impregnated and cell metalloporous cathodes, metalloceramic and boron-coated cathodes and their heaters. Major attention is given to the rational selection of cathodes, their structures, materials and processing methods. Chapters I—IV were written by B. P. Nikonov; V and VII by A. V. Morozov; VI and IX A. I. Mel'nikov; and VIII by G. A. Kudintseva, A I. Belousov, P. M. Bernshteyn, L. A. Vikman, A. A. Gugnin, L. A. Yermolayev, A. B. Kiselev, M. V. Kaganovich, G. M. Kuznetsova, E. V. Lobova, R. A. Makarova, L. N. Nevskaya, V. I. Nekrasov, T. M. Novikova, I. A. Noskova, N. M. Ogaleva, S. Ye. Rozhkov, V. Smirnov,

Card 1/6 UDC: 621.385.7

ACC NR: AM6029193

L. Ya. Smoktiy, and A. Ye. Filippova participated in the experiments described in the book. References follow each chapter.

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APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001033420013-4"

ACC NR: AM6029193

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SUB CODE: 09/ SUBM DATE: 05Apr66/ ORIG REF: 186/ OTH REF: 139

Card 6/6

MIL'NIKOV, A. I.

Agriculture

Wines and their preparation for champagnization. Moskva, Pishchepromizdat, 1951

Monthly List of Russian Accessions, Library of Congress, November 1952.
UNCLASSIFIED.

MEL'NIKOV, A.I.

We are improving technology and quality. Vin.SSSR 15 no.3:18-24 '55. (MLRA 8:8)

1. Glavnoye upravleniye vinodel'cheskoy promyshlennosti.
(Champagne (Wine))

MEL'NIKOV, Aleksandr Illarionovich; ORESHKIN, M.V., retsenzent; UNGURYAN, P.N., spetsredaktor; KRUGLOVA, G.I., redaktor; KISINA, Ye.I., tekhnicheskiy redaktor

[The resevoir method of Soviet champagne production] Proizvodstvo sovetskogo shampanskogo rezervuarnym sposobom. Moskva, Pishchepromizdat, 1956. 113 p. (MLRA 10:1)
(Champagne (Wine))

MEL'NIKOV, A.I.; VAYNBERG, A.S.; VASIL'YEVA, G.N., red.; SOKOLOVA, I.A., tekhn. red.

[Progressive practices in Ukrainian champagne plants] Peredovoi opyt zavodov shampanskikh vin Ukrainy. Moskva, Pishchepromizdat, 1957. 45 p. (MIRA 11:12)

(Ukraine--Champagne(Wine))

ALEKSEYEV, N.A.; ASLANOV, A.N.; VASIN, G.D.; VORONINA, Ye.P.; GRIGORENKO, G.P.; GRUSHIN, F.Ye.; DEPARMA, V.N.; DRESVYANNIKOVA, D.F.; DUBININA, K.F.; KITAYEV, I.Ye.; KULIKOV, N.N.; MANUKOV, N.P.; MELNIKOV, A.I.; REZNOV, I.P.; PESTRYAKOV, A.I., redaktor; PAVLOVA, M.M., tekhnicheskiy redaktor; SOKOLOVA, N.N., tekhnicheskiy redaktor

[Mechanization and electrification at the All-Union Agricultural Exhibition; 1956 guidebook] Mekhanizatsiia i elektrifikatsiia na Vsesoiuznoi sel'skokhoziaistvennoi vystavke; putevoditel', 1956. Moskva, Gos. izd-vo sel'khoz. lit-ry, 1956. 305 p. (MLRA 10:3)
(Moscow--Agricultural machinery--Exhibitions)

MEL'NIKOV, A.

Rural electrification in the Russian Federation. Sel'.stroi. 14 no.5:9-11 My '59. (MIRA 12:8)

1. Nachal'nik Glavnogo upravleniya elektrifikatsii sel'skogo khozyaystva Ministerstva sel'skogo khozyaystva RSFSR.
(Rural electrification)

MEL'NIKOV, A.

Every province should have a strong electric power supply. Sel'. stroi. 15 no.1:11-12 Ja '61. (MIRA 14:3)

1. Nachal'nik Glavsel'elektro Ministerstva sel'skogo khozyaystva RSFSR.

(Rural electrification)

MEL'NIKOV, A.

Lenin's ideas on the electrification of agriculture in action.
Sel. stroi. no.4:3-4 Ap '62. (MIRA 15:8)

1. Nachal'nik Glavsel'elektro Rossel'khoztekhniki.
(Electricity in agriculture)
(Lenin, Vladimir Il'ich, 1870-1924)

88473

S/078/61/006/001/007/019
B017/B054

5.2100

AUTHORS: Mel'nikov, A. Kh., Firsova, T. P.

TITLE: Low-temperature Reaction of Sodium Hyperoxide With Water Vapor

PERIODICAL: Zhurnal neorganicheskoy khimii, 1961, Vol. 6, No. 1, pp. 169 - 176

TEXT: The reaction of sodium hyperoxide (NaO_2) with water vapor at -10, -5, and 0°C and a water vapor pressure of 2.0 - 4.6 mm Hg was dynamically investigated by the apparatus shown in Fig.1. Results are compiled in a table. Fig.2 shows the kinetics of oxygen delivery and the absorption of water vapor in the reaction of sodium hyperoxide with water vapor. The reaction of sodium hyperoxide with water vapor between -10 and 0°C proceeds according to the equation $2\ NaO_2 + nH_2O \longrightarrow Na_2O_2.nH_2O + O_2$. Fig.4 shows the ternary diagram of the system Na_2O - 1/2 O_2 - H_2O at 0, -5, and -10°C. The heat effect of the formation of sodium peroxide octahydrate

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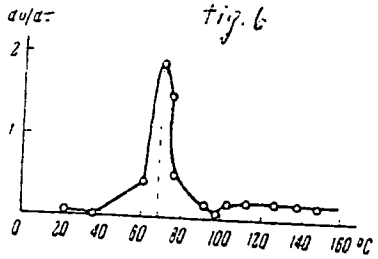
Low-temperature Reaction of Sodium Hyperoxide With Water Vapor

S/078/61/006/001/007/019
B017/B054

from NaO_2 and water vapor is 115.48 kcal, in the reaction with water it is 29 kcal. In the reaction of granulated sodium hyperoxide with water vapor at +20°C, a monohydrate of sodium hydroxide is formed with delivery of active oxygen. The octahydrate of sodium hyperoxide was synthesized. Its specific gravity is 1.56 at 0°C. Two endothermic effects appear on the heating curves, the first at 50 - 70°C, the second at 110 - 130°C. Fig.6 shows the rate of oxygen delivery from the octahydrate of sodium hyperoxide as a function of temperature. I. A. Kazarnovskiy, S. Z. Makarov, N. K. Grigor'yeva, and V. R. Kotov are mentioned. There are 6 figures and 19 references: 9 Soviet, 9 US, and 1 French.

SUBMITTED: October 8, 1959

Fig. 6



Card 2/2

17.1151 also 1273,1583
11.2140

27894
S/078/61/006/010/001/010
B121/B101

AUTHORS: Mel'nikov, A. Kh., Firsova, T. P., Molodkina, A. N.

TITLE: Production of pure preparations of sodium peroxide and potassium superoxide

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 6, no. 10, 1961, 2225-2229

TEXT: An improved method has been developed for producing pure preparations of sodium peroxide, (Na_2O_2), and potassium superoxide, KO_2, by oxidizing the metals with oxygen. The apparatus is shown in Fig. 1. Reaction flask 1 is filled with the alkali metal by feeding part of the metal, previously melted in a test tube, through a capillary tube into flask 1. Sodium peroxide was produced from sodium and oxygen in a two-stage process. In the first stage, an oxygen pressure of 6-8 mm Hg is applied for about 30 min; the second stage lasting for 2-2 1/2 hr is performed under atmospheric pressure. At the beginning of oxidation an orange-colored luminescence of the metal occurs at 240-250°C, which may be prevented by reducing the O_2 supply. Complete oxidation occurs at a

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Production of pure preparations of...

temperature of 360°C at most. The loose reaction product formed can easily be removed from the reaction space. The process is easily reproducible and gives yields of 100 % of Na_2O_2. Potassium superoxide is similarly formed: Metallic potassium is treated in the first stage for 30-40 min at an oxygen pressure of 6-8 mm Hg, and in the second stage for 4-5 hr at atmospheric pressure. The initial temperature in the oxidation process applied to obtain potassium superoxide is 110-120°C, and the final temperature is 350°C at most. The KO_2 yield was 92.74-98.34 %. This process involves a noticeable corrosion of the glass reaction vessel owing to silicate formation. Thus, high-purity preparations can be obtained only in vessels resistant to alkali oxides. Proper dosing of oxygen results in a reaction time only one-fourth or one-fifth that required with the use of air in the first stage. A paper by I. A. Kazarnovskiy, S. I. Raykhshteyn (Zh. fiz. khimii, 21, 245 (1947)) is mentioned. There are 2 figures, 2 tables, and 3 references: 1 Soviet and 2 non-Soviet. The reference to the English-language publication reads as follows: A. V. Harcourt, J. Chem. Soc. (London), 14, 267 (1862).

SUBMITTED: September 15, 1960

Card 2/3

5 2440
17 1155

27895
S/078/61/006/010/002/010
B121/B101

AUTHORS: Mel'nikov, A Kh, Firsova, T P.

TITLE: Interaction of sodium superoxide and carbon dioxide in the presence of water vapor

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 6, no. 10, 1961, 2230-2236

TEXT: The reaction of sodium superoxide with carbon dioxide in the presence of water vapor is studied by a dynamic method in the temperature range from -10 to +25°C. The apparatus is described in Zh. neorg. khimii, 6, no. 10 (1961). At -10, 0, and 10°C, the humidity of the gas mixture corresponded to saturation; at 25°C, relative humidity was 25 or 50 %. It was found that oxygen was set free but incompletely below 10°C (only "superoxide oxygen"): $2NaO_2 + 2CO_2 = Na_2C_2O_6 + O_2$ (6) Humidity assists to form the peroxy-dicarbonate ($Na_2O_2 \cdot 8H_2O$ as intermediate product) The absorption of carbon dioxide proceeds slowly under these operating conditions. The molar ratio CO_2/O_2 tot exceeds 1. A significant change of the reaction process occurs at 25°C. Evolution of oxygen proceeds very

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27895
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B121/B101

Interaction of sodium superoxide and

quickly and the capability of sodium superoxide to absorb carbon dioxide decreases; the molar ratio CO_2/O_2 falls below 0.5. The following reactions occur: (1) $2NaO_2 + H_2O = 2NaOH + 1\ 1/2\ O_2$ (2) $2NaOH + CO_2 = Na_2CO_3 + H_2O$. Sodium peroxy dicarbonate $Na_2C_2O_6$ was synthesized from sodium superoxide or sodium peroxide, carbon dioxide, and water. The initial peroxides were ground with a certain quantity of ice. The concentration of carbon dioxide in the initial gas mixture did not exceed 1 % by volume and was increased to 100 % by volume during the reaction. The reaction product is concentrated with alcohol and ether, and liberated from adsorbed ether vapors by vacuum distillation. Identical products were obtained from sodium peroxide and sodium superoxide (yield 68-85.9 %); this was confirmed by thermal analysis. Thermal decomposition of sodium peroxy dicarbonate occurs with simultaneous evolution of active oxygen and carbon dioxide $Na_2C_2O_6 = Na_2CO_3 + CO_2 + 1/2\ O_2$ (7). There are 3 figures, 2 tables, and 4 references: 2 Soviet and 2 non-Soviet.

SUBMITTED: September 15, 1960

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29529
S/078/61/006/011/004/013
B101/B147

AUTHORS: Mel'nikov, A. Kh., Firsova, T. P.

TITLE: Interaction between sodium peroxide octohydrate and gaseous carbon dioxide

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 6, no. 11, 1961, 2470-2473

TEXT: In a previous paper (Zh. neorgan. khimii, 6, no. 10 (1961)), the authors found that the reaction between NaO_2 and CO_2 in the presence of water vapor yielded sodium peroxy-dicarbonate, $Na_2C_2O_6$. In this synthesis, $Na_2O_2 \cdot 8H_2O$ was produced as intermediate stage. Since $Na_2O_2O_6$ might be of practical importance as mild oxidizer, it was synthesized by reacting CO_2 with $Na_2O_2 \cdot 8H_2O$. The latter can easily be synthesized from NaOH and H_2O_2. Dry CO_2 was conducted over $Na_2O_2 \cdot 8H_2O$ which was contained as a thin layer in a flask. The reaction vessel was cooled by water. The synthesis proceeded in three stages: (1) p_{CO_2} = 3 mm Hg, 1.5 - 2 hr; (2) p_{CO_2} = 30 mm Hg,

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0.5 hr; (3) alternate filling of the reaction vessel with pure CO_2 and subsequent evacuation for removing the water residues. Experiments were performed between 0 and 33°C. 85.7 - 95 % yields of $Na_2C_2O_6$ were obtained independent of temperature. The specific weight of this compound which was pycnometrically determined in benzene was 2.075 at 20°C. The product contained $NaHCO_3$ as impurity. The following data are given:

Substance	Molecular weight	Density, g/cm³	Specific volume, cm³/mole	Relative change of volume
$2NaO_2$	110	2.18	50.5	1.00
$Na_2O_2 \cdot 8H_2O$	222.1	1.57	142	2.81
$Na_2C_2O_6$	166	2.075	80.0	1.58

Therefrom it follows that carbonization of octohydrate causes a considerable decrease of volume. The differential thermal analysis of $Na_2C_2O_6$ with a Kurnakov pyrometer showed an endothermic effect at 102°C, which corresponds

Interaction between sodium peroxide...

to thermal decomposition of $Na_2C_2O_6$ into Na_2CO_3. From a 30% KI solution, I_2 is liberated by $Na_2C_2O_6$. The action of water on $Na_2C_2O_6$ initiates hydrolysis already at room temperature. Active oxygen and, especially at the beginning of the process, CO_2 are set free (Fig. 3). For this course of hydrolysis, the following is assumed: Formation of $NaHCO_4$, then of H_2CO_4, and decomposition into CO_2 and H_2O_2. Decomposition of H_2O_2, liberation of active oxygen, is the slower process. There are 3 figures, 2 tables, and 2 Soviet references.

SUBMITTED: September 15, 1960

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S/078/62/007/006/004/024
B124/B138

AUTHORS: Mel'nikov, A. Kh., Firsova, T. P., Molodkina, A. N.

TITLE: Interaction of potassium hyperoxide with water vapor and carbon dioxide

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 7, no. 6, 1962, 1228-1236

TEXT: When studying the interaction of potassium hyperoxide with water vapor between -10 and +19°C it was shown that practically no peroxide oxygen was set free at -10°C, while at 0°C 3/4 of the original peroxide oxygen remained in the product, even after 3 hrs. Practically the whole peroxide oxygen was set free at 19°C. At 10°C and below, the hydrated compounds $K_2O_2 \cdot nH_2O$ were formed, while at 19°C and above KO_2 was converted to KOH with release of the whole active oxygen, and - in the presence of sufficient water vapor - KOH was formed in various hydrated forms and solutions. Fig. 3 shows the gradual change of composition of the solid phase, and Fig. 4 shows the arrangement for studying the interaction between KO_2 and CO_2. The interaction depends mainly on temperature.

The composition of the end product depends on the transition phase formed during the first stage of interaction between KO_2 and water vapor. At $10^{\circ}C$ and below, hyperoxide oxygen is set free, and potassium peroxodicarbonate $K_2C_2O_6$ is formed, while at $50^{\circ}C$ and above potassium carbonate and bicarbonate are formed with the release of all the active oxygen (Figs. 7 and 8). Between 10 and $50^{\circ}C$, the formation of $K_2C_2O_6$ is mainly determined by the effective removal of the heat of the exothermic reaction between KO_2 and CO_2. No proofs have been found for the formation of potassium monopercarbonate, K_2CO_4, and potassium pyrocarbonate, $K_2C_2O_5$.

There are 8 figures and 2 tables. The three most important English-language references are: P. W. Gilles, J. L. Margrave, J. Phys. Chem. 60, 1333 (1956); C. A. Kraus, E. F. Parmenter, J. Amer. Soc. 56, 2385 (1934); J. R. Partington, A. U. Fathallah, J. Amer. Chem. Soc., 1934 (1950).

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova Akademii nauk SSSR (Institute of General and Inorganic Chemistry imeni N. S. Kurnakov of the Academy of Sciences USSR)

Interaction of potassium hyperoxide ...

SUBMITTED: November 1, 1960

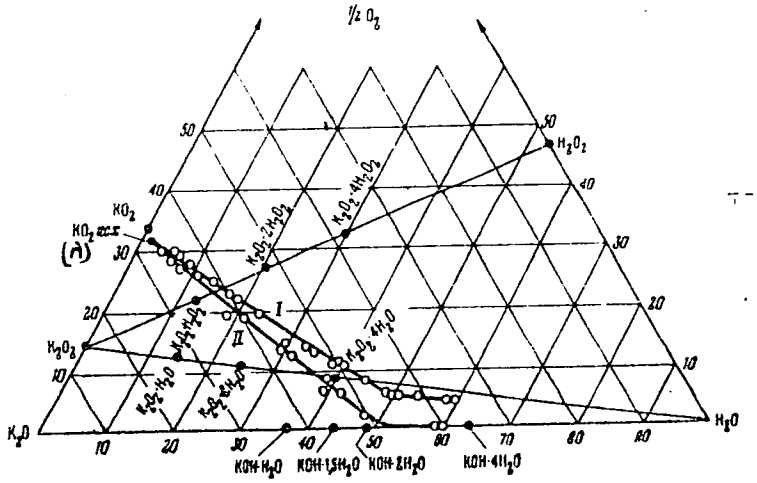

Fig. 3. Ternary diagram for K_2O - $(1/2)O_2$ - H_2O. (I) Test temperature -10 and 0°C; (II) test temperature 19°C. Legend: (A) KO_2 initial.

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S/078/62/007/006/005/024
B124/B138

AUTHORS: Mel'nikov, A. Kh., Pirsova, T. P., Molodkina, A. M.

TITLE: Production of pure potassium peroxodicarbonate and study of some of its properties

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 7, no. 6, 1962, 1237-1241

TEXT: The authors studied the optimum conditions for the conversion of potassium hyperoxide to potassium peroxodicarbonate, and compared the properties of the latter with those of peroxodicarbonate obtained according to E. J. Constam and A. Hansen. They used 98.7% potassium hyperoxide as initial product. A mixture of CO_2 and water vapor was continuously blown through a thin layer of fine-grained product. The temperature of the thermostat, in which the reactor was placed, was kept at -10°C; the hyperoxide layer was heated to 10°C by the heat released during the reaction. The experiments took 1-2 hrs; they were carried on until constant weight was reached. Finally, the product was dried with dry air for 2-3 hrs, first at experimental and then at room temperature.

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The resulting product was light-brown whereas the electrolytic product had a pale-bluish color. The product obtained by interaction of KO_2 with CO_2 had an average purity of ~ 85%. The electrolytic production of $K_2C_2O_6$ from saturated K_2CO_3 solution was performed in an H-shaped vessel with a porous separating wall; platinum wire was used as anode and a platinum disk as cathode. A VSA-10 (VSA-10) selenium rectifier provided alternating current of 15-16 v and 0.1-0.3 a. The electrolyte temperature was -15 to -20°C and the purity of the product up to 99.9%. Dry $K_2C_2O_6$ preparations obtained by the two methods are fairly stable, even at room temperature. Losses of active oxygen within 1 year are only fractions of 1% at room temperature. The product becomes gradually brighter. The thermogram obtained by Kurnakov pyrometer (Fig. 2) showed two endothermic effects, at 155-160°C (thermal decomposition of $K_2C_2O_6$) and at 198-200°C (decomposition of $KHCO_3$). The specific gravity of pure $K_2C_2O_6$ obtained from KO_2 was determined pycnometrically in benzene solution at

20°C. It was 1.97, while for electrolytic $K_2C_2O_6$ it was 1.95.

S. Z. Makarov and I. I. Vol'nov are mentioned. There are 3 figures and 2 tables. The English-language reference is: I. R. Partington, A. U. Fathallah, J. Chem. Soc. (London), 1934 (1950).

ASSOCIATION: Laboratoriya perekisnykh soyedineniy, Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova Akademii nauk SSSR (Laboratory of Peroxide Compounds, Institute of General and Inorganic Chemistry imeni N. S. Kurnakov of the Academy of Sciences USSR)

SUBMITTED: December 3, 1960

Fig. 2. Thermogram of potassium peroxodicarbonate: (a) obtained from potassium hyperoxide; (b) obtained electrolytically. Legend: (A) R_{diff} = 1000 ohms; (B) R_{simple} = 70,000 ohms; (C) time, min.

ACCESSION NR: AT4028335

S/0000/63/000/000/0128/0139

AUTHOR: Mel'nikov, A. Kh.; Firsova, T. P.; Molodkina, A. N.; Morozova, T. G.; Aksenova, I. V.

TITLE: Investigation of the reaction of sodium superoxide and potassium superoxide with water vapor and carbon dioxide and the synthesis of percarbonates

SOURCE: Soveshchaniye po khimii perekisny*kh soyedineniy. Second, Moscow, 1961. Khimiya perekisny*kh soyedineniy (chemistry of peroxide compounds); Doklady* soveshchaniy. Moscow, Izd-vo AN SSSR, 1963, 128-139

TOPIC TAGS: sodium peroxide, potassium peroxide, water vapor, carbon dioxide, percarbonate, percarbonate synthesis, oxygen, water, sodium superoxide, potassium superoxide

ABSTRACT: The authors investigate the reaction of sodium superoxide and potassium superoxide with water vapor and carbon dioxide at a lowered temperature and study the properties of the solid phase of the peroxide type formed in the process of this reaction. The work is divided into two segments: 1) the investigation of reaction process kinetics of sodium and potassium superoxides with water vapor and carbon dioxide in the presence of water vapor and 2) the synthesis and study of properties

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ACCESSION NR: AT4028335

of the peroxide type of solid phases formed in the low temperature reaction of sodium and potassium superoxides with carbon dioxide and water vapor. Diagrams of the illustrations are shown; graphs showing the kinetic curves of oxygen seperation, water vapor and carbon dioxide absorption are presented. Tables presenting the composition of potassium and sodium percarbonates are given. The study of the reaction kinetics shows two directions of the process dependent on the temperature. Within a temperature region of from +10° to -10°C, sodium and potassium superoxides react with water vapor and carbon dioxide, accompanied by a discharge of superoxide oxygen only and the formation of sodium and potassium percarbonates. The intermediate phases of the reaction process of sodium and potassium superoxide with water vapor and carbon dioxide at low temperatures are synthesized. Some of the properties, previously unpublished (thermo-stability, specific weight, hydrolysis, etc.) are studied. Orig. art. has: 4 tables, 9 figures, and 9 formulas.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. NS Kurnakova AN SSSR (Institute of General and Inorganic Chemistry AN SSSR)

SUBMITTED: 13Dec63 DATE ACQ: 06Apr64 ENCL: 00

SUB CODE: CH NO REF SOV: 017 OTHER: 019

Card 2/2

45459
S/078/63/008/003/002/020
B117/B186

11 2140

AUTHORS: Mel'nikov, A. Kh., Firsova, T. P.

TITLE: Reaction of hydrogen peroxide vapor with hydroxides of alkali and alkaline-earth metals

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 8, no. 3, 1963, 560-562

TEXT: Chemisorption was suggested as an efficient method of producing peroxide compounds of alkali and alkaline-earth metals from solid hydroxides and hydrogen peroxide vapor. Compared with other methods, it has the following advantage: the effect of hydrogen peroxide vapor on solid hydroxides and the simultaneous removal of the water set free in the reaction create conditions which prevent the hydrolysis of the dissolved peroxide compounds and hence their complete destruction. The reactions were studied in vacuo. It was possible to feed the reaction vessel continuously with hydrogen peroxide, to remove the water at the same time, and to control the pressure in the system. The latter is decisive in maintaining the hydrogen peroxide concentration acting on the hydroxide surface. A smooth reaction with nearly quantitative transformation of H_2O_2 into Li_2O_2, Na_2O_2, KO_2, and CaO_2 took place. Since

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the reaction occurred only on the surface of the granulated hydroxide, it may be possible to increase the metal peroxide yields by enlarging the reaction surface. There are 1 figure and 1 table.

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SUBMITTED: January 16, 1961

MARKOVICH, B.N.; MEL'NIKOV, A.K.

Crankshaft presses with adjustable drives. Kuz.-shtam. proizv. 2 no.5:38-41 My '60. (MIRA 14:3)

(Power presses—Electric driving)